ABSTRACT

The dispersion plane of a line-narrowed excimer or molecular fluorine laser system can be substantially aligned with the discharge plane, or a plane of approximate current flow between discharge electrodes. Such alignment provides for utilizing a portion of the discharge that is more stable and uniform than in existing systems by avoiding the effects of variations across the current flow on the optical output. A slit aperture can be placed across the discharge direction in order to eliminate the index gradient in the dispersion plane. The beam can be amplified using a separate amplifier chamber, or by having the beam make a second pass through a remaining portion of the gain volume in the laser chamber. To further increase the uniformity of the output beam, the portion of the beam output from the "oscillator" portion can be rotated by 90 degrees before being input to the amplification portion. The amplification pass then can serve as an additional spectral filter, as only spectral components in the center of the beam are effectively amplified.